Serial No.: 10/614,031

REMARKS

This response is being filed in response to the Office Action dated January 19, 2005. For the following reasons, this application should be considered in condition for allowance and the case passed to issue.

The allowance of claims 12-18 is gratefully acknowledged, as well as the indication of allowability of claims 4-11 if rewritten in independent form to include all of the limitations of the base claims and any intervening claims. However, in light of the arguments presented below, these claims have not been rewritten in independent form at this time.

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Rao et al. in view of Yonehara et al. Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rao et al. in view of Yonehara et al. and further in view of Bastasz et al. These rejections are hereby traversed and reconsideration and withdrawal thereof are respectfully requested. The following is a comparison of the present invention with the Rao et al., Yonehara et al., and Bastasz et al. references.

The present invention relates to a method of determining a work function of a metal and comprises the steps of forming a metal-on-silicon (MS) Schottky diode with a metal having a work function to be determined forming contacts of the MS Schottky diode. A capacitance-voltage curve of the MS Schottky diode is measured. The work function of the metal is determined based on the measured capacitance-voltage curve.

The present invention provides a simple and fast method of screening potential gate materials by determining their metal work function. Schottky diodes have been employed to measure a MOS-CV curve to thereby determine the metal work function of metal materials. The Schottky diodes were formed by employing traditional lithography metal deposition and etch

processing steps. The Schottky diodes were metal-on-oxide-on-silicon diodes. The formation of the Schottky diodes by this traditional method is relatively expensive and time-consuming. This is a disadvantage when it is desirable to screen a large number of potential gate materials. Neither of the references, either alone or in combination, show or suggest the invention as now claimed.

Rao describes the characteristics of Al/p-$Cu_{0.5}Ag_{0.5}InSe_2$ polysilicon crystalline thin film Schottky barrier diodes, that are conceded by the Examiner as being formed a glass substrate, and not a silicon substrate. The Examiner states that Rao shows a method of determining a work function of a metal comprising the steps of forming a Schottky diode (metal-on-glass) with a metal having a work function to be determined forming contacts of the MS Schottky diode. However, since the Examiner recognizes that Rao fails to show the formation of a metal-on-silicon (MS) Schottky diode, Rao cannot possibly describe measuring a capacitance-voltage curve of a MS Schottky diode. Nor can Rao show or suggest the formation of a MS Schottky diode with a metal having a work function to be determined forming contacts of the MS Schottky diode. Simply put, Rao does not disclose a MS Schottky diode.

Yonehara, U.S. Patent No. 5,219,769, was cited by the Examiner for supplying this missing feature. In particular, the Examiner stated that Yonehara explicitly teaches the silicon substrate as a conventional equivalent alternative to a glass substrate. The Examiner asserted that although diamond substrates are exemplified, Yonehara teaches conventional substrates which are used to form a Schottky diode, which includes silicon or glass substrates as equivalents or alternates. However, this reading of Yonehara is factually incorrect. Yonehara fails to teach a metal-on-silicon (MS) Schottky diode. The silicon substrate discussed at column 4 lines 45-50, is the substrate 43 featured in Fig. 4. Also, refer to column 3, lines 36 to column

4, line 15. The substrate 43 is coated with a diamond surface 42. It is on this diamond layer 42 that an aluminum electrode 41 is provided. In other words, Yonehara teaches forming a metal-on-diamond Schottky diode, and not metal-on-silicon Schottky diode. The substrates discussed are only disclosed as being coated with diamonds. Therefore, even if combined with Rao, the two references together would suggest a combination, at best, of a silicon substrate covered by a diamond coating with a metal diode formed on the diamond coating. To suggest otherwise would ignore the clear teachings of these references and involve impermissible hindsight. In neither reference is there any teaching of providing metal on silicon.

Bastasz, U.S. Patent No. 4,782,302 does not disclose a metal-on-silicon Schottky diode as required by the claims of the present invention, in contrast to the Examiner's assertion. Instead, it appears that the reference describes, for example at column 2, lines 16-34, a metal-oxide-semiconductor that receives a deposit of a metal such as palladium to form the Schottky barrier diode. As it states, preferably, a silicon substrate is treated to have a thin layer of silicon dioxide. This is quite different from the MS Schottky diode described and claimed in the present invention, as discussed in the application. Therefore, Bastasz, even in combination with Rao and Yonehara, fails to show or suggest the claims of the invention.

This is a response to a second, non-final Office Action, in which the claims have not been amended. The references provided to date have failed to factually support the arguments presented in the Office Action. Because of this, it is respectfully requested that the application be allowed expeditiously.

In light of the arguments presented above, this application should be considered in condition for allowance and the case passed to issue. If there are any questions regarding this

Serial No.: 10/614,031

Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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